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ABSTRACT

A sample of college students was used to determine whether there was a correlation between Lowenfeld's visual-haptic continuum and Piaget's concrete-formal continuum. Three instruments were administered--a questionnaire, the Successive Perception Test I (Gibson) which identified an individual's location on the visual-haptic continuum, and the paper and pencil test of Longeot which ascertained the subjects' concrete-formal orientations. A Pearson product moment correlation between the continua was .32 based on 88 observations. The relationship was significant at the .05 level. A lack of relationship was found between age and either the perceptual aptitude or the intellectual level continuum. There was a relationship between a person's location on Lowenfeld's visual-haptic continuum and Piaget's concrete-formal continuum. The correlation found attributed 10.24 percent of the variance to some common factor. (RC)

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THE CORRELATION BETWEEN LOWENFELD'S VISUAL-HAPTIC CONTINUUM AND PIAGET'S CONCRETE-FORMAL CONTINUUM IN STUDENTS ENROLLED IN A BUSINESS COLLEGE

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Introduction

Educators generally agree that the failure of our educational system is a travesty of justice. A system as fluid and as flexible as ours should be able to cope with individual problems. Yet is this the case? Of course, the answer to this question is seemingly no. Every year, our system produces a greater number of functional illiterates than it did the previous year. The fate of many of these failures is a lifelong incarceration at poverty socioeconomic levels. The problem is now of such magnitude as to have stimulated a national back to basics movement. A movement in many cases which means the eradication of all educational frills and a return to, "readen, riten, and rithematic." The failures have also stimulated many researchers.

The rising number of educational failures has motivated educational and psychological researchers the world over. Moreover, these failures have been the genesis of much governmental concern. We are increasingly seeing greater and greater sums of federal monies made available for those who seek to answer these questions through research. A glance at the literature shows that the problems are being attacked from a multidirectional approach. Some researchers are investigating failure from a congenital point of view. Others are looking at failure from a developmental angle, while still others are seeking answers by investigating the perceptual component of failure.

Inhelder and Piaget (1958), and Piaget (1967, 1972) reported the existence of four stages of intellectual development through

which individuals proceed as they progress from birth to adulthood. The autors named these stages the sensorimotor, peroperational, concrete and formal operational. Rather than there being discrete dividing lines between the stages, the union of all form a continuum. The stage names simply allow the categorization of certain abilities the individual possesses once he has reached that segment of the developmental hierarchy.

The individual who has reached the concrete level of development is able to deal only with concrete situations. On the other hand, one who has reached the most advanced or formal operational stage is able to deal with abstractions. No longer are first hand concrete situations necessary. Lawson (1973) compared the intellectual level of the subject matter, and the subject matter presentation, with the intellectual level of the students in his sample. This investigator found generally that the subject matter was presented at a level beyond the developmental level of the majority of the Ss. It naturally follows that presenting information at too great an intellectual level might lead to academic failure.

Lowenfeld (1939, 1945, 1949, 1952, 1965, 1970, 1975) identified two types of perceptual aptitudes which individuals exhabit beginning at about age twelve. He named these types the visual and the haptic haptic. According to Lowenfeld, the extremes of these types occupied the antipodes of a continuum. In addition, each of the extreme types could be identified by a specific set of characteristics, while those who fell somewhere between the antipodes exhibited varying degrees of each set. The visual

person is an objective viewer of the environment who uses his/her eyes as the main avenue of information acquisition. Information taken in via this mode is easily retrieved and accurately reporduced. Individuals at this antipode of the continuum are able to easily obtain an overview of a scene, then disect it into its component parts followed by the synthesis of a new and complete whole.

The haptic individual on the other hand is wholly a subjective viewer of the environment. Relationships between this type of individual and his/her environment are subjective. Unlike the visual, the haptic person quickly becomes lost in the details of a scene without being able to obtain an overview, and additionally is unable to integrate sequential impressions into a coferent whole. Finally, although the haptic is of normal visual acuity, he/she uses the eyes only when forced to do so. The main avenue of information acquisition is through the kinesthetic tactile mode, and information so acquired is not converted to visual impressions.

Erickson (1963, 1964, 1966, 1967, 1969) on several occasions found those who tended to be more haptically oriented, tended to be the lower achievers. Here then is another possible cause of learning failure.

It might be questioned whether there is a correlation between these continua, and if so, what inferences might be made concerning learning difficulties and teaching styles. Schlenker (1977) found when comparing these continua in college students, that a .23 correlation existed. While this correlation suggests

that only 5.3% of the variance was attributable to some common factor, the sample size was small. Schlenker inferred that the correlation might well be substantially higher if the study were rerun using a larger sample.

Purpose

The primary purpose of the investigation was to ascertain whether there was a correlation between Lowenfeld's visual-haptic continuum and Piaget's concrete-formal continuum.

Sample

A sample of 120 undergraduates was drawn from Husson College, Bangor, Maine. Husson College is a post secondary institution which offers Associate in Applied Science and Bachelors degrees in various business categories.

The sample was drawn on a convenience basis, and ranged in age from 216.0 to 295.0 months, with a mean age of 250.696 months and a standard deviation of 48.618 months. The sample included 94 females and 26 males, the majority of whom were enrolled in AAS degree programs. The sample could be further described by the Ss eventual academic goals. Of the 120 Ss, 59 hoped to obtain an AAS degree, 29 a bachelors degree, and 13 hoped sometime in the future to obtain a masters degree. In addition, 19 Ss failed to indicate their academic goal when asked on a questionnaire.

Instruments

The data gathering process involved the administration

of three instruments. One of the instruments was a questionnaire, and the other two were tests. All were administered by the instructor of the course in which the students were involved. The test administerer was not the investivator.

The Successive Perception Test I, CP 509C, Gibson (1947) was used to identify an individuals location on the visual-haptic continuum. The instrument consisted of 35 tachistoscopically introduced nonsense figures. The Ss were asked, after viewing each figure, to identify it from a field of five nonsense or random figures. One point was allowed for each correct response, and the greater the score, the more visually oriented the S was assumed to be.

The paper and pencil test of Longeot (1962, 1965) was used to ascertain the Ss concrete-formal orientations. The test consisted of 28 items and one point was allowed for each correct answer. In the case of items requiring more than one answer the respondent was required to supply all answers correctly before the point was allowed. The greater the S score, the more formal he/she was assumed to be.

Statistical Tools

A Pearson Product Moment correlation was computed to identify the strength of the relationship between the continua and to ascertain whether there was a relationship between one's location on either of the two continua and his/her age. A regression equation was computed for the relationship between the variables. This equation was written using information supplied by the use of the regression analysis technique.

Results

The Pearson Product Moment correlation between the continua was .32 based upon 88 observations (N changed from 120 to 88 because of absences). The relationship was significant at less than or equal to the .05 confidence level. A lack of relationship was found between age and either the perceptual aptitude or the intellectual level continuum.

The regression equation, in terms of preceptual aptitude, was found to be;

$$\text{Perceptual Aptitude} = 15.00717 + .32818\,\text{Intellectual Level} - .01758\,\text{Age}$$

Discussion

The answer to the question posed earlier is affirmative, there is a relationship between a persons location on these continua. The correlation found here attribute 10.24% of the variance to some common factor. The increasing magnitude of the correlation with increasing sample size, Schlenker (1977) as compared with this study, suggests that a yet even stronger relationship might exist. Additionally, there seems little if any relationship, within the age range of this sample, between an individuals perceptual aptitude and his/her age or between one's level of intellectual development and his/her age.

Paramount in these findings are certain inferences concerning learning difficulties, their possible causes, and perhaps even their rectifications. Whether perceptual aptitude is partially the result of intellectual development or the converse, at this

point, lacks importance. What is important is the suggestion concerning types or methods of information presentation and their possible relationships to educational failure. Quite obviously, students who fall into the haptic-concrete category will have greater achievement problems than those falling in the visual-formal category, especially since we already know that much of our contemporary instruction is presented at a level of abstraction beyond that comprehendable by many students. What compounding effects these continua have upon achievement is yet to be investigated. One might hypothesize; however, that instructional treatments designed specifically with both continua in mind might be better facilitators of achievement than designs which take only one continuum into account.

Conclusions

The fact that there is a relationship between the way some individuals orient to these continua raises more questions that it answers. Perhaps this relationship will, in the final analysis, be illucidated as one of the reasons why our educational system enjoys such a high failure rate. However, it would be premature at this point to draw such a conclusion. The finding of this study points to a rich and perhaps fruitful research area.

The study should be rerun using a larger sample size and random sampling techniques. Studies should be run which relate the

combinational effects of these continua to achievement.

In this light, analysis of covariance techniques might provide the sought after answers.

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